

**Written Amendment**  
(Amendment based on Article 11)

To the Commissioner of the Patent Office

**1. Identification of the International Application**  
PCT/JP03/05966

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**4. Object of Amendment:** Specification and Claims

**5. Contents of Amendment**

(1) As per attached sheets, we amend the Title of the Invention on page 1 of the specification (corresponding to page 1 of the English translation) to --THIN BATTERY AND METHOD FOR PRODUCING THE SAME--.

(2) As per attached sheets, in claim 1 on page 13 of the claims (corresponding to page 15 of the English translation), we insert the phrase "the reinforcing frame is a plastic molding, the case element is a press-formed product made of a metal thin plate, and the case element is formed so as to be integrated with the reinforcing frame" after "a reinforcing frame fixed to the case element along a circumference of a swelling wall of the housing portion".

(3) As per attached sheets, we cancel claim 2 on page 13 of the claims (corresponding to page 12 of the English translation).

(4) As per attached sheets, we add claim 8 on page 14 of the claims (corresponding to page 13 of the English translation).

**6. List of appended documents**

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| (1) New page 1 of the specification (translation: page 1)      | one copy |
| (2) New pages 13 and 13/1 of the claims (translation: page 12) | one copy |
| (3) New page 14 of the claims (translation: page 13)           | one copy |

## DESCRIPTION

## THIN BATTERY AND METHOD FOR PRODUCING THE SAME

5    Technical Field

The present invention relates to a card-shaped thin battery used, for example, as a power source of a portable information terminal.

Background Art

10       The above-mentioned type of battery is known in, for example, JP11(1999)-176400A. In this publication, as shown in FIG. 9, the battery is composed of a battery unit 30, an outer case 31 for housing the battery unit 30, a corrosion-preventive resin sheet 32 for separating the battery unit 30 from the outer case 31, and the like. The battery unit 30 is formed in a flat  
15      mat shape with a winding body 33 compressed in an elliptical shape in cross-section, which includes a positive electrode, a negative electrode and a separator, an electrolyte solution, and a container 34 made of a laminated film for housing the winding body 33 and the electrolyte solution. The outer case 31 is composed of an upper case 31a and a lower case 31b connected in a  
20      lid-fitting manner. The battery unit 30 is sealed in the upper and lower cases 31a and 31b. The upper and lower cases 31a and 31b respectively are composed of a plate-shaped case wall member 35 obtained by press-forming an aluminum plate material and plastic frames 36 fixed to front and back sides of four circumferential portions of the case wall member 35. For  
25      example, the case wall member 35 is subjected to insert molding so as to be integrated with the frames 36 during formation of the frames 36. There also is a battery obtained by subjecting the upper and lower cases to plastics molding in their entirety.

In the above-mentioned battery, the upper and lower cases 31a and 30 31b are composed of the case wall member 35 made of aluminum and the frames 36 made of plastic. Therefore, the battery can be rendered light-weight. However, since the thick frames 36 are fixed to front and back sides of four circumferential portions of the case wall member 35, the total thickness of the battery cannot help being enlarged, and there is a limit to the 35 reduction in thickness of the battery.

Furthermore, according to the configuration in which the winding body 33 including a positive electrode, a negative electrode, an electrolyte

## CLAIMS

1. (Amended) A thin battery comprising:
  - a battery module; and
  - 5 an outer case for housing the battery module, the outer case comprising:
    - a first case body comprising connection walls;
    - a second case body comprising connection walls, wherein the connection walls of the first case body and second case body connect the first case body and the second case body to each other on outer circumferential portions;
    - 10 at least one selected from the first case body and the second case body comprising:
      - a dish-shaped case element with a housing portion swelling from one surface; and
      - 15 a reinforcing frame fixed to the dish-shaped case element along a circumference of a swelling wall of the housing portion,
      - wherein the reinforcing frame is a plastic molding, and the case element is a press-formed product made of a metal thin plate formed so as to be integrated with the reinforcing frame,
    - 20 wherein the battery module is housed within the housing portion, and sealed in the outer case by attaching the connection walls of the first case body to the connection walls of the second case body.
  - 25 2. (Cancelled)
  3. The thin battery according to claim 1, further comprising a mounting region formed on an outer surface of the connection wall adjacent to the swelling wall of the housing portion, wherein the mounting region comprises a control module for the battery module and a cover for protecting the control module.
  - 35 4. The thin battery according to claim 3, wherein the control module comprises a protection circuit, output terminals, and input terminals, and a pair of the input terminals of the control module are connected to be

fixed to a positive tab and a negative tab of the battery module led to the mounting region, whereby the control module is fixed to the mounting region.

5. The thin battery according to claim 3, wherein the outer case is formed in a rectangular card shape, the mounting region is provided on one side of the outer case, the cover comprises a principal plane wall covering an outer surface of the control module and a pair of leg chips projecting from both ends of the principal plane wall, and terminal windows for exposing the output terminals of the control module are opened in the principal plane wall.  
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6. The thin battery according to claim 1, further comprising a concave portion for preventing reverse insertion further is formed on one side of the outer case, wherein the concave portion is engaged with a convex portion for preventing reverse insertion provided in a battery insertion portion of an apparatus in which the battery is to be mounted.  
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7. The thin battery according to claim 1, further comprising a concave portion for preventing dropping formed on one side of the outer case, wherein the concave portion is engaged with the convex portion for preventing dropping provided in an apparatus in which the battery is to be mounted.  
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8. (Added) A method for producing a thin battery comprising a battery module and an outer case for housing the battery module,  
the outer case comprising a first case body and a second case body  
25 comprising connection walls for connecting the first case body and the second case body to each other on outer circumferential portions,  
at least one selected from the first case body and the second case body comprises a dish-shaped case element with a housing portion swelling from one surface and a reinforcing frame fixed to the disk-shaped case element  
30 along a circumference of a swelling wall of the housing portion,  
wherein the reinforcing frame is a plastic molding, the case element is a press-formed product made of a metal thin plate, and the case element is formed so as to be integrated with the reinforcing frame,  
the battery module is housed in the housing portion, and the battery  
35 module is sealed in the outer case by attaching the connection wall of the first case body to the connection wall of the second case body.